

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 15 NOV 2005

Applicant's or agent's file reference BRE363	FOR FURTHER ACTION		WIPO See Form PCT/PEA/410	PCT
International application No. PCT/EP2004/052972	International filing date (day/month/year) 16.11.2004	Priority date (day/month/year) 20.11.2003		
International Patent Classification (IPC) or national classification and IPC G01B7/00				
Applicant MARPOSS SOCIETA' PER AZIONI et al.				

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the International application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 14.09.2005	Date of completion of this report 11.11.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Beyfuß, M Telephone No. +49 89 2399-2725

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/052972

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

2-13 as originally filed
1, 1a received on 14.09.2005 with letter of 13.09.2005

Claims, Numbers

2(part), 3-14 as originally filed
1, 2(part) received on 14.09.2005 with letter of 13.09.2005

Drawings, Sheets

1/4-4/4 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/052972

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-14
	No: Claims	
Inventive step (IS)	Yes: Claims	1-14
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/EP2004/052972

Reference is made to the following documents:

D1: JP 2002 181502*

D2: IT-B-1 179 306

D3: PATENT ABSTRACTS OF JAPAN vol. 011, no. 335 (P-632), 4 November 1987
& JP 62 119402

D4: US 2003/159302 A1

D5: WO 2004/011874 A & PATENT ABSTRACTS OF JAPAN vol. 012, 5 December
2003 & JP 2004 109110*

*: For the above JP documents computer generated English translations are
available from the INTERNET (Japanese Patent Office / JPO).

Re Item V:

1. Technical Field: Measuring dimensions of workpieces by contact feelers
2. Prior Art

D4 discloses a measuring head of the type of construction proposed in the present application (casing with transducer inside, movable arm with feeler outside), however without a particular zero-setting mechanism. The measuring head of **D3** has inside the housing a mechanism for simultaneously zero-setting and locking, activated by a handle outside the housing.

The documents **D1** and **D2** are more relevant and can be seen equally as closest prior art:

The head of **D1** comprises a casing 12, a movable arm with a first portion 14 and a second portion 38 carrying a feeler 42, and a position transducer 18. Moreover, the head comprises a zero-setting mechanism for adjusting the mutual arrangement between portion 14 and portion 38. The whole mechanism comprises the parts 60,

58, 50, 36, 44, 62, 66 in combination with the side arm 22 and the movable reference plate 24. The lever 60 forms a "quick lock/unlock device" which is located between said first portion 14 and said second portion 38 and which fixes the mutual arrangement between portions 14 and 38. The reference plate 24 is movable between a first "zero-point setting location" and a second "release location" which is accomplished by ball plungers 29A and B.

The head of **D2** has a position transducer 11 in a casing 1 and a movable arm 8 with a feeler 21 for contacting the workpiece. The arm has two portions coupled by a frictional coupling outside the casing. A lever 42 (142,242) with a mechanical reference is attached to the casing for zero-setting. The lever can be used in a rapid manner and apparently it locks/unlocks the device so that it can be seen as "quick locking/unlocking device".

3. Novelty (Article 33(2) PCT)

The subject matter of independent claim 1 differs from the head of **D1** in that the movable mechanical reference is arranged at the exterior of the casing. Moreover, the subject matter of independent claim 1 differs from the head of **D2** in that the quick locking/unlocking device is between the first portion and the second portion of the movable arm. **The subject matter of independent claim 1 is thus new.**

4. Inventive Step (Article 33 (3) PCT)

Starting from **D1** the feature "arranging the mechanical reference outside the casing" contributes to increasing flexibility.. There was no real indication found in the available prior art to include this feature in D1. A respective change in the design would require several modifications in D1 which are not seen as obvious to a skilled person. Starting from **D2** there is no real indication seen to place the mechanical reference between the first portion and the second portion of the movable arm which would also require some non obvious modifications in the design. **The subject matter of independent claim 1 is thus also based on an inventive activity.**

5. Dependent Claims

The dependent claims 2 to 14 only add particular features to the subject matter of independent claim 1. **The subject matter of claims 1 to 14 is thus also new and based on an inventive activity.**

6. Industrial Applicability (Article 33(4) PCT)

The subject matter of the claims 1-14 is industrially applicable, eg. for checking workpieces in the manufacturing line.

Re item VI:

For completeness is remarked that **D5** (a "P"-document) shows a head with a very similar design with respect to the zero-setting mechanism and the locking/unlocking device as compared to that of **D1**.

Re item VII:

Independent claim 1 is drafted in the two-part form (Rule 6.3(b) PCT), which has been apparently used to delimit the subject matter from the disclosure of **D2**. However, the quick locking/unlocking device would then be incorrectly placed in the characterising part (see item V/2). Since **D1** could be equally seen as closest prior art, a one-part form seems in the present case acceptable.

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DESCRIPTION**«HEAD FOR THE LINEAR DIMENSION CHECKING OF MECHANICAL
PIECES»**

5

Technical Field

The present invention relates to a head for the linear dimension checking of mechanical pieces, including a casing, a movable arm with a first portion partly located inside the casing and a second portion entirely located at the exterior of the casing, a position transducer inside the casing and associated with the first portion, a feeler coupled with the second portion for contacting the piece to be checked, a zero-setting mechanism for adapting the head, by adjusting the mutual arrangement between the first portion and the second portion of the movable arm, to check pieces with different nominal dimensions, the zero-setting mechanism including a movable mechanical reference between the movable arm and the casing, arranged at the exterior of the casing, the movable mechanical reference being adapted to take two positions, to hold the first portion of the movable arm in a preset position with respect to the casing and to release the first portion, respectively.

25

Background Art

Gauging heads are known - more specifically gauging heads for checking dimensions of pieces being machined in grinding machines - which include one or two movable arms, each comprising two mutually adjustable portions, a first portion coupled with a transducer of the head and a second portion carrying a feeler for contacting the pieces to be checked.

Japanese patent application published with No. 2002-181502 shows gauging heads of this type, in which measuring arms

- 1a -

carrying feelers are coupled to base arms through clamp mechanisms, while a moving plate pushes the base arms to the zero point positions of relative transducers. The moving plate - as well as a relevant guide mechanism with a
5 block and rods - is arranged inside a main body, or casing, of the head and acts against set arms which are also internally arranged.

International patent application published with No. WO 2004/011874 shows gauging heads having also arms with
10 portions clamped to each other and an internal moving plate pushing internal portions of the arms to the zero point positions of relative transducers.

Italian patent No. 1179306 describes some forms of gauging heads according to the prior art portion of claim 1, in
15 which the two portions of the

- 14 -

CLAIMS

1. A head for the linear dimension checking of mechanical pieces, including
- 5 a casing (1),
a movable arm (7) with a first portion (8) partly located inside the casing (1) and a second portion (9) entirely located at the exterior of the casing (1),
a position transducer (11) inside the casing (1) and
10 associated with said first portion (8),
a feeler (19) coupled with said second portion (9) for contacting the piece to be checked,
a zero-setting mechanism (40) for adapting the head, by adjusting the mutual arrangement between the first portion
15 (8) and the second portion (9) of the movable arm (7), to check pieces with different nominal dimensions, the zero-setting mechanism (40) including a movable mechanical reference (27) between the movable arm (7) and the casing (1), arranged at the exterior of the casing (1), the
20 movable mechanical reference (27) being adapted to take two positions, to hold said first portion (8) of the movable arm (7) in a preset position with respect to the casing (1) and to release the first portion (8), respectively,
characterized in that the zero-setting mechanism (40)
25 includes a quick locking/unlocking device (20) between said first portion (8) and said second portion (9) of the movable arm (7).
2. The head according to claim 1, wherein the zero-
30 setting mechanism (40) includes a first abutment and reference surface (43), integral with the casing (1), said movable mechanical reference (27) including a second abutment and reference surface (44), integral with the movable arm (7), said first abutment and reference surface
35 (43) and said second abutment and reference surface (44) being adapted to mutually cooperate for defining said

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